

## HR- 171 The Effectiveness of a Limestone Aggregate Covering on Highway Back Slopes in Controlling Erosion and in Establishing Plant Cover

**Key Words:** Highway backslopes, Rock mulch, Erosion control

### ABSTRACT

A research project was initiated early in 1974 to determine the effective-ness of a rock mulch of crushed limestone aggregates in controlling soil losses on highway construction back slopes in Iowa and to find the influence of such treatments on stand establishment of grasses and legumes.

Limestone applications were made and test plots established on two construction sites. The first was located on Highway 141 in Section 20, Township 80 north, Range 25 west in Polk County, Iowa near bridges over Beaver Creek approximately two miles north of the town of Grimes. The second test was located on Highway 17 in Sections 18 and 19, Township 88 north, Range 26 west in Hamilton County, Iowa approximately three miles south of Webster City.

The stone used at the Grimes site was both 1" and 1-2" top size commercial concrete stone. The spread rate was varied from 100 to 135 tons per acre. The application varied from slightly less than one stone thick to slightly more than that.

The stone used at the Webster City site was an unwashed commercial stone with a top size of 1" and relatively few fines. This stone was applied slightly re than one stone thick or at a rate of approximately 135 ton per acre.

On October 1 the moisture content of the soil was higher under rock than on the check plot. On October 21 there was no difference in soil moisture on the mulched as compared to the non-mulched plots.

During April, May and June 1975 rainfall was high and moisture did not limit plant growth at either site.

This research has lead to the conclusions and discussion that follows. Limestone rock designated as commercial stone, sized 1" to 1<sup>1</sup>/<sub>4</sub>", when applied uniformly at a rate of about 100 to 135 tons per acre is effective in controlling erosion under average Iowa weather conditions on 3:1 highway backslopes in late Wisconsin till that are protected from accumulations of water spilling across the backslope from higher positions.

Plant growth of permanent seeding was better under the rock mulch than on the non-mulched ground and by mid July plant growth at both study sites was sufficient under the mulch to be effective in controlling soil erosion.

During the one period of moisture stress during the course of this study, soil moisture percentage was higher under the rock mulch than on the non-mulched ground.